

Conservation status of *Banksia* woodlands on the Swan Coastal Plain

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Introduction

Banksia woodlands are such a familiar sight to urban Perth dwellers that few would consider these communities to be of serious conservation concern. However, many areas of woodland have been cleared of native vegetation recently, and an assessment of the conservation status of *Banksia* woodlands is, therefore, both appropriate and long overdue.

The *Banksia* woodlands chosen for study were those confined to the Bassendean and Spearwood dune systems of the Swan Coastal Plain from Lancelin southwards, and in mapped vegetation complexes in which banksias were described as being dominant by Heddlé *et al* (1980). Using satellite imagery at a scale of 1:250 000, the area of *Banksia* woodland communities on the Swan Coastal Plain extant in 1986 was determined and compared with original areas (see Burbidge & Rolfe, in prep., for a detailed account).

Clearing of *Banksia* woodlands

By 1986 an estimated 55% of the 281 000 ha of *Banksia* woodland complexes between Lancelin and Capel on the Bassendean and Spearwood dune systems had been cleared entirely of native vegetation (Table 1). The destruction of the seven complexes varied from 90% for the small area of Bootine Complex (north of Gingin) to only 2% of the equally small Karrakatta Complex-North-Transition Vegetation Complex (NE of Lake Pinjar).

The two largest complexes, Bassendean—North and Bassendean—Central and South, differed substantially (37% vs 85% respectively cleared). Essentially, little remains of the once extensive *Banksia* woodlands from Perth southwards to Busselton. Only in the Moore River National Park—Yeal Swamp—Melaleuca Park areas north of Perth are large tracts of *Banksia* woodlands still to be found.

Conservation on reserves

Only 7% of the original 281 000 ha of *Banksia* woodlands investigated was on conservation reserves (Table 1, and Fig. 1 of J.S. Beard, this volume), and those reserves were uneven in geographical distribution and among vegetation complexes. Some of these deficiencies will be addressed by proposed additions to the conservation estate in CALM's Northern Forest and Central Forest Region Management Plans 1987-1997. However, in these and other areas the conservation of remnant *Banksia* woodlands currently lies very much in the hands of owners of private property or Crown lands set aside for purposes other than flora and fauna conservation.

Rare and threatened species

Although poorly studied, *Banksia* woodlands appear to contain few rare localized endemic species. However, the extensive clearing of these woodlands has resulted in some plants and vertebrate animals declining in numbers to the point where they are now considered highly vulnerable or endangered.

Two declared endangered reptiles occur in the *Banksia* woodlands of the Swan Coastal Plain. The Carpet Python (*Morelia spilota*) is widespread in Australia but scarce throughout its range. The Black-striped Snake (*Vermicella calonotus*) is almost confined to the Swan Coastal Plain, from Lancelin to Mandurah and most commonly in the deep white sands of the Bassendean and Spearwood dunes. A third reptile, the Lined Skink (*Lerista lineata*), is not declared endangered but is of limited occurrence, being found only on the Swan Coastal Plain from Perth to Yalgorup. Varanid lizards have also declined markedly in *Banksia* woodlands (How & Dell, this publ.).

Many species of birds have declined in numbers on the Swan Coastal Plain (Storr & Johnstone 1988) although no bird species is restricted to the area and the *Banksia* woodlands do not constitute a major part of the breeding habitat of any declared endangered bird species. However, the *Banksia* woodlands do provide an important feeding resource for non-breeding flocks of Carnaby's Black-Cockatoo (*Calyptorhynchus funereus latirostris*) which has declined markedly due to clearing of native vegetation in the wheatbelt (Saunders *et al* 1987).

Amongst the mammals, it is possible that only a few species of small mammal maintain viable populations in *Banksia* woodlands (How & Dell, this publ). For example, the Western Quoll (*Dasyurus geoffroii*) is possibly locally extinct and in *Banksia* woodlands the Numbat (*Myrmecobius fasciatus*) is now restricted to a small, highly vulnerable population in the Canning Vale area.

Little is known about the conservation status of *Banksia* woodland invertebrates (Majer, this volume).

The King Spider Orchid (*Caladenia huegelii sens str*) and two hammer orchids (*Drakaea jeanensis* and *D. micrantha* Hopper *ined*) are the only plants currently declared as rare flora that occur mainly in *Banksia* woodlands on the Swan Coastal Plain. However, ephemeral wetlands dotted through the *Banksia* woodlands have three additional declared rare plants—Purdie's Donkey Orchid (*Diuris purdiei*), Stalked Water Ribbon (*Aponogeton hexatepalus*) and Minute Pygmy Sundew (*Drosera occidentalis*).

Table 1

The area of *Banksia* woodland vegetation complexes still extant on the Swan Coastal Plain in 1986, and their representation in the total CALM estate and in conservation reserves.

Woodland Complex*	Original area (ha)	% extant† in 1986	% in CALM estate	% on reserves
37 Bootine	3 911	9.8	1.0	1.0
43 Bassendean-North	78 261	63.0	32.8	11.1
44 Bassendean-Central & South	86 123	14.5	8.8	1.6
45 Bassendean-North-Transition	20 845	86.5	44.9	39.3
47 Karrakatta-North	43 868	41.0	42.6	0
48 Karrakatta-North-Transition	5 282	97.7	10.7	0
51 Cottesloe-North	43 062	55.6	34.5	4.5
Totals	281 353	45.2	27.3	7.2

* as defined and mapped by Heddle *et al* (1980)

† these figures represent very conservative estimates of the amount of habitat destruction in the *Banksia* woodlands. Much of the remaining woodlands exists only in small patches and in many of these the understorey is highly modified by disturbance agents such as grazing.

While still locally common, several other plant species endemic or nearly so to *Banksia* woodlands need to be monitored in the future, eg *Banksia laricina*, *Eremaea pupurea*, and *Caladenia speciosa* Hopper *ined*. The woodlands also contain a number of outlying populations well removed from their main areas of occurrence, eg southern populations of Winter Bells (*Blancoa canescens*) and *Conostylis latens* in Canning Vale.

Management for conservation

Other papers in this publication allude to major management concerns facing *Banksia* woodlands—fire, dieback disease, herbivory by rabbits, fertilizer drift, groundwater extraction and weed invasion to name but a few of the most important. To this list might also be added various recreational activities (trail bike riding, off road vehicle use) and commercial pursuits (wildflower picking, bee keeping, grazing by stock) that require management.

While these issues deserve our concerted efforts, perhaps of greatest and immediate concern is the ongoing pace of clearing of *Banksia* woodlands for agricultural, urban and industrial development projects. While some land uses such as mining are obliged to go through an environmental impact assessment process before they can clear native vegetation, this does not apply under current legislation to others such as residential developments. Any program to rectify this situation must include a concerted effort at public education concerning environmental issues.

The management of remnants of *Banksia* woodlands set aside for conservation poses a number of problems, as does the management of remnants of native vegetation generally (Saunders *et al* 1987). It seems likely that inappropriate fire regimes can promote invasion of perennial weeds such as veldt grass, and

lead to gradual degradation of conservation values (Hopkins, this publ). We know little of the population ecology of *Banksia* woodland species, and require this sort of understanding to plan future management strategies (eg Lamont, this publ).

Future Directions

New initiatives are needed to improve on the conservation estate in both Crown and private ownership. Those proposed and already reviewed in the public arena (System 6, CALM Regional Management Plans) need to be implemented as soon as possible if the land involved is not to suffer degradation through other inappropriate land uses. Indeed, biologists will have to work harder at communicating the value of conserving *Banksia* woodlands if we are not to witness the rapid attrition of these communities over the next few decades.

Few rare and threatened species are known to be endemic to these *Banksia* woodlands, but there are some among plants. These require research and the development of appropriate management strategies. The possible local extinction of predatory medium sized mammals like Quolls is, however, an early warning that many common *Banksia* woodland species will become threatened unless we research, plan for and actively manage the remnants extant today.

References

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